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K-65 SAMPLING OU#4
U.S. DOE -FERNALD
OH6 890 008 976

8-15-90

USEPA/DOE
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LETTER

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

1277

AUG 15 1990

REPLY TO ATTENTION OF:
5HR-12

Mr. Bobby J. Davis
United States Department Of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

RE: K-65 Sampling OU#4
U.S. DOE-Fernald
OH6 890 008 976

Dear Mr. Davis:

On July 26, 1990, the United States Department of Energy (U.S. DOE) submitted a an amendment to the remedial investigation (RI) work plan that proposed additional sampling for operable unit #4. Specifically, the document proposes additional sampling of the waste material contained in the tanks and borings and sample collection of soils around and below the tanks.

Plans for both of these both of these sampling efforts were previously approved by the United States Environmental Protection Agency (U.S. EPA). The internal sampling was not completed and the external sampling not performed due to health and safety considerations. The July 26, 1990, proposals amend the previous RI work plan addendums.

Pursuant to the 1990 Consent Agreement, U.S. EPA approval or disapproval is due by August 27, 1990, unless notice is given to U.S. DOE that more time is needed to complete review. Due to the submission of the documents by U.S. DOE so close to the starting date for field work, U.S. DOE requested U.S. EPA accelerate our review. In response to this request by U.S. DOE, U.S. EPA is providing the comments on the internal sampling plan ahead of schedule.

GENERAL COMMENTS:

1. The issue of the release of radioactive materials, other than radon-222, and other hazardous substances from use of the vibracore must be addressed. It is important to determine whether radium, thorium, and radon daughter products will be released in quantities sufficient to cause doses to members of the public approaching or exceeding the standard of 40 CFR 61, Subpart H of 10 mrem/year. Such a project

would normally required NESHAP analysis if the potential exists for increased emissions (except radon 222).

2. The number of samples proposed to be collected may not be sufficient to characterize the materials in the K-65 silos. The analytical data from 1955 and 1958 has been used to determine the number of samples needed to be analyzed. There are three problems using these data. First, the samples were collected from the transfer lines and not the silos themselves. Second, the data they use from 1955 and 1958 is from an extraction test; extraction procedures tend to buffer or moderate the variability between samples. Third, an examination of the 1989 data appears to shows significant variability between samples (barium and copper data, for example). Therefore, the discussion presented in Section 2.2 does not seem to be valid.

3. As mentioned above, it does not appear that the determination of the number of samples needed to characterized the materials in the silos is supported by the data. The sampling frequency should be doubled (half the sample length) of the sections to be analyzed. However, the number of composite samples can remain the same. In addition, it would be appropriate that, at a minimum, the composite TCLP extracts, and possibly all TCLP extracts, also be analyzed for all TCLP organic compounds and pesticides. The proposed increase in the number of samples is justified when considering the relatively low cost of analyses compared to the overall cost of the K-65 sampling investigation.

4. Due to the radioactivity of the samples, holding times for volatile organic compounds will almost certainly be exceeded. Volatile organic compound could, if present, be a problem during solidification and vitrification processing. Therefore, every effort must be made to analyze the samples within the required time-frames (samples from the 1989 sampling were analyzed for volatile organic compound more than three months after collection).

5. There are no specific quality control procedures listed in the Sampling and Analysis Plan (SAP). Quality control is only mentioned in passing. The sampling plan needs to address the type, number, frequency and methodologies associated with quality control samples. Potential sample types include trip blanks, transport blanks, field/rinseate blanks, collocated samples, split samples and spikes. A table should be developed to cover these samples.

6. The exact methodology for compositing samples from the core sections needs to be included in the detailed work procedures. The procedures, as they exist now, only address the steps for transferring a sample from the core section to the sample bottles.

7. The SAP primarily addresses samples that are expected to be dry in nature. It is not inconceivable that some samples could be semi-solid or semi-liquid. Samples falling in this category would require

modification of several procedures including sample transfer from core section to sample bottles, decontamination procedures, collection of representative samples and requested sample analyses.

SPECIFIC COMMENTS:

8. Page 1, First Paragraph: An accurate description of the previous studies needs to be presented. Previous sampling attempts were not successful in going to the required depths or collecting complete samples.

9. Section 2.1: There is no indication of which statistical approach was selected; procedure SW-846 or the tolerance limit approach. Drawbacks associated with each were presented. Regardless of the statistical approach that was taken, statistical analysis justifying the number and type of samples should be included in this section in its entirety.

10. Section 2.1, Page 4, Paragraph 3: There are two potential interpretations of this statement, both having different implications. The first is that the current U.S. EPA-approved extraction procedures were not in place at that time and therefore were not used, resulting in no leachate generated and no data. The second is that leachate was generated, but not using U.S. EPA protocols, therefore no "usable" data was generated. The statement should be clarified to define the intent. Furthermore, the 1989 data provided leachate data of known quality.

11. Page 5, Second Paragraph: The statement "there is high probability that the waste will be relatively homogenous in the horizontal direction" needs to be justified and more specific.

12. Page 6, Table 2-1: Units for radium (mg/ton) are highly unconventional. Using standard conversions, 1.1 nanocuries/gram equals 277 mg/ton and radium concentrations are more than 100 times this value.

13. Section 2.2, Page 7, First Paragraph: The text indicates that the selection of the number of samples was based on four samples of K-65 residues collected between 1955 and 1958. The mean and standard deviation were calculated using data generated from these four samples. The small standard deviation was used to justify the conclusion that only two samples were needed to characterize the wastes in these silos. This may or may not be appropriate as the instrument detection limits and method detection limits achievable in the 1950's were not nearly as sensitive as present day technology. Aside from this issue, four samples may not yield statistically sound results.

14. Page 7, First Paragraph: In referencing "two samples from each core", it should be specified whether these are two samples from each strata or composites.

15. Section 2.2, Page 9: Describe the method used for selecting the exact location of the representative sample from each section. The selection of zones relies on physical variability and radioactivity. However, the rationale for delineating the sections within each zone, including the representative section, is not presented.

16. Section 2.2, Page 9: The term "representative" should be defined in this context.

17. Section 2.2, Page 9: The description of the sampling scheme is confusing. The determination of zones based on physical appearance, radioactivity, or arbitrary top-middle-bottom classification will introduce variability into the locations of sections. The entire length of the core should be divided at set intervals, like 1.0 or 1.5 foot intervals, and numbered accordingly. Appearance and radiation considerations can be added as a secondary identifier. This is the most accurate way to characterize average radionuclide concentrations.

18. Page 12, First paragraph: The term "unbiased" is not correct, since the method described (30 inches) introduces systematic bias.

19. Page 12, First paragraph: Equal masses, not volumes, should be composited since the activity/concentration per unit mass is what is derived.

20. Table 2-2: The following omissions have been made:

Composite 20	omits 2S2-NW-D1
5	omits 2S1-SE-D3
10	omits 2S1-NW-D3
15	omits 2S2-SE-D1

21. Section 2.3, Page 12, Paragraph 4: The number, type, location and frequency of quality control samples have not been specified. Specify whether <u>all</u> composite samples will be analyzed for radiological parameters, HSL inorganics, and TCLP.

22. Section 2.3, Page 12, Paragraph 5: It is stated that four samples from each core (eight total) will be analyzed for HSL organics, PCBs and pesticides. However, table 2-2 shows ten analyses will be done.

23. Section 2.3, Page 13: Table 2-2 does not include analyses for samples 2S1-NE-A and 2S2-NE-A. These core samples are described and diagramed on page 10 in Figure 2-3.

24. Section 2.3, Page 13: Table 2-2 does not agree with the text. Section 2.3 appears to say that all samples will be analyzed by TCLP

where as the table indicates that only samples from the NW core will be analyzed after TCLP extraction.

25. Section 2.3, Page 14, First Paragraph 1: Specify which composite samples will be used for physical testing. This would be difficult to do on those samples that are slated for chemical analyses. If they are sub-samples from existing cores, as is implied in Figure 2-4, that should be spelled out in the text.

26. Section 2.3, Page 14, First Paragraph: The fourth "visual" horizontal zone composite mentioned here needs to be included in Table 2-2. Table 2-2 includes only six of these composites, instead of eight.

27. Page 15, Figure 3.1: The examination trailer is proposed to be located in a relatively high "background" area (perhaps 1 millirem per hour), which would flaw the sensitivity of the examination of samples.

28. Page 17, 3.1.1: The term "comparatively low background" must be quantified and its effects on the sensitivity of radiological examination described.

29. Page 19, Last paragraph: A description of how it will be determined that the vibracore is one-foot from the bottom must be explained.

30. Page 21, 3.2.2: The rational for adjusting the vibracore to penetrate soil north of silo #4 to simulate conditions in the silos is not clear. An alternative should be proposed.

31. Page 23, 3.4, Page 24, Table 3-1: The contamination levels presented in Table 3-1 should be specified as fixed, removable, or fixed and removable. The method for measurement should be specified, including instruments that are to be used, fixed scan or wipe-test count).

32. Section 3.4, Page 25, First Paragraph: Elaborate on storage and ultimate disposal of excess decontamination solutions and waste/water here. A brief discussion of disposal of decontamination solutions and wastewater should be incorporated into the description of each activity rather than referencing a later section.

33. Section 3.7, Page 28, Paragraph 3: The analysis of the TCLP extract should include all TCLP organic compounds. Submission of revised QAPP TCLP analytical procedures and QA requirements should be provided.

Appendix A:

34. DWP-001, Page 4, Section 6.6: The leather gloves, if used, should be disposed after use.

35. DWP-001, Page 7, Section 7.2: The 75 mR/hr specified here conflicts with paragraph 6.11, which states an action level of 100 mR/hr.

36. DWP-001, Page 7, Section 7.2.3: Explain how the bag is to be inflated.

37. DWP-001, Page 10, Section 7.3.13: The second sentence is unclear. The term "cognizant operations technician" should be defined in the definitions section.

38. DWP-001, Page 11, Section 7.3.18: Because this procedure involves the manual wiping of the sampling barrel, a safety procedure should be included here that specifies an action level beyond which manual wiping should not be attempted. If the removed waste is highly radioactive, finger ring dosimeters will not give a real-time reading of dangerous radiation levels.

39. DWP-002, Page 3, Section 6.1: The statement "A defined safety system is not involved" should be clarified.

40. DWP-002, Page 5, Section 7.2: A rationale for periodic monitoring rather than continuous monitoring should be given here. If continuous monitoring is not practical during this operation, the frequency of periodic monitoring should be specified in the text.

41. DWP-002, Page 6, Section 7.3.5: The text should read "...on the form..." rather than "...on the core...".

42. DWP-002, Page 8, Section 7.4.7.1: The instructions need clarification. Specifically, describe how the inner sides of the lexan tubes are to be removed when the only opening thus far is at the end of the tube. A drawing of the procedure would be helpful. Also, explain how this will prevent cross contamination.

43. DWP-002, Page 9, Section 7.4.7.2: Define what is to be discarded.

44. DWP-002, Page 9, Section 7.4.9: Specify what is meant by "...proper sample aliquot...". The instructions need to be more explicit.

45. DWP-002, Page 9, Section 7.4.9: Indicate which equipment is needed to retrieve the sample from the core section. Describe decontamination procedures for this equipment.

46. DWP-002, Page 9, Section 7.4.9: Explain the rationale for selecting the exact location of the portion of the section to be sampled.

47. DWP-002, Page 9, Section 7.4.13: Indicate whether the sample bottle remains open during this procedure. Also, describe which instrumentation is to be used.

48. DWP-002, Page 9, Section 7.4.13: It should be mentioned that the radiation meters may need to be removed to a lesser contaminated area

to reach background levels after use. Specify what is meant by a "...low background area...".

49. DWP-002, Page 9, Section 7.4.14: If liquid is generated during decontamination, the collection and disposal of this waste must be addressed.

50. DWP-002, Page 10, Section 7.4.21: Disposal of the tape from the end caps should be presented.

51. DWP-002, Page 11, Section 7.7: Decontamination procedures for equipment should be spelled out rather than referenced.

52. DWP-002, Page 11, Section 7.7: Procedures for field blanks/rinseate blanks need to be included.

53. DWP-002, Page 14: Figure 3 needs to include a title (Sample Collection Log).

54. DWP-004, Page 3, Section 6.1: This sentence should read "A life-line or other safety device providing an equivalent level of protection...shall be worn..."

55. DWP-004, Page 3, Section 6.2: The precise definition or diagram of the "...center area of the silo..." should be included.

56. DWP-004, Page 6, Section 7.2.2: Because the sampling plan specifies that a drop light be lowered into the silo before testing for explosive gases, the specification in this section should include only explosion-proof lighting. Rather that using explosion-proof lighting on a contingency basis, as suggested in the procedures, such lighting should be exclusively specified at the outset of sampling activities.

57. DWP-004, Page7, Section 7.2.9: This sentence should be modified to read: "If explosive gases are not detected, lower drop light into the silo..."

58. DWP-005, Page 2, Section 2.1.4: The safety equipment list should include an explosimeter for the detection of dangerous conditions within the silos.

59. DWP-005, Page 7, Section 4.2.1: The text specifies continuous radon monitoring will be conducted at the fence line. If possible, such monitoring should be conducted at the top of the silos, near the sampling personnel.

60. DWP-005, Page 9, Section 1.3: The silo sapling safety equipment checklist should include explosimeter instruments.

61. DWP-006, Page 4, Section 6.6: Sections 6.6 and 6.8 are redundant.

U.S. EPA will be providing comments on the boring and sampling proposal for outside the silos by August 27, 1990. To further accommodate U.S. DOE's time constraints, U.S. EPA has arranged a conference call for Wednesday, August 15, 1990, at 9:00 AM Central Time to resolve these comments. These comments are required to be addressed in a revised document that is to be submitted within thirty (30) days of the date of this letter.

Please contact me at (312) or FTS 886-4436, if there are any questions.

Sincerely,

Catherine A. McCord

Catherine A. McCord
Remedial Project Manger

cc: Dr. Richard Shank, OEPA
Graham Mitchell, OEPA-SWDO
Leo Duffy, U.S. DOE